

Docket No. 520.43596X00  
Serial No. 10/791,823  
Office Action dated October 18, 2005

## **REMARKS**

### **I. Introduction**

By the present Amendment, claims 1, 2, 4, and 5 have been amended. Claims 6-8 are newly presented for consideration. No claims have been cancelled. Accordingly, claims 1-8 are now pending in the application. Claims 1 and 5 are independent.

### **II. Office Action Summary**

In the Office Action of August 11, 2005, The Specification was objected to. Claims 1 and 3 were objected to because of several informalities. Claims 2 and 4 were rejected under 35 U.S.C. §112, second paragraph. Claims 1-4 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,572,538 issued to Saitoh, et al. ("Saitoh"). Claims 1 – 5 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,309,319 issued to Messina in view of Saitoh. These rejections are respectfully traversed.

### **III. Objections to the Specification**

The Specification was objected to because of various informalities related to the Abstract of the Disclosure. Regarding this Objection, the Office Action points out that MPEP 608.01(b) requires the Abstract to be within a range of 50-150 words. The Office Action further indicates that the present Abstract exceeds 150 words.

Applicants have prepared a new Abstract, and concurrently submitted the same herewith, which sufficiently describes the disclosure and conforms to the

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requirements of MPEP 608.01(b). Accordingly, the objections to the Specification should be withdrawn.

#### **IV. Claim Objections**

Claims 1 and 3 were objected to because of various informalities that appeared to be typographical errors. For example, the Office Action notes that claim 1 recites the phrase "an electronic parts", while claim 3 recites the phrase "said ion exchange bag are".

By the present Amendment, applicants have amended independent claim 1, in part, to address the typographical error cited in the Office Action. With respect to claim 3, applicants note that this particular error was corrected in the Amendment filed on July 18, 2005. Accordingly, the objection to these claims should now be withdrawn.

#### **V. Rejections Under 35 USC §112**

Claims 2 and 4 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention. With respect to this rejection, the Office Action notes that claims 2 and 4 each recite the limitation "said ion exchange holder." The Office Action further notes that there is no antecedent basis for this particular limitation.

By the present Amendment, applicants have amended claims 2 and 4 to address the instances of indefiniteness cited in the Office Action.

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It is therefore respectfully submitted that, as amended, claims 2 and 4 satisfy the requirements 35 U.S.C. §112, second paragraph.

**VI. Rejections under 35 U.S.C. §102**

Claims 1-4 were rejected under 35 U.S.C. §102(b) as being anticipated by Saitoh. Regarding this rejection, the Office Action states that Saitoh discloses a liquid cooling system that comprises a pump for supplying a cooling liquid, a heat-receiving jacket, a radiator, and flow passages for circulating the cooling liquid in a route passing through the radiator. In particular, the Office Action alleges that Saitoh discloses an ion exchange bag having a permeable bag enclosing an ion exchange resin therein. Applicants respectfully disagree.

As amended, independent claim 1 defines a liquid cooling system that comprises:

a pump for supplying a cooling liquid;  
a heat-receiving jacket, being supplied with said cooling liquid, for receiving heat from an electronic parts;  
a radiator, being supplied with said cooling liquid passing through said heat-receiving jacket, for radiation heat therefrom; and  
flow passages for circulating said cooling liquid in a route passing through said radiator back to said pump, wherein:  
an ion exchange bag, having a water-permeable bag enclosing an ion exchange resin therein, is disposed in a part of said route, and  
said ion exchange bag enables ion exchange through diffusion on a surface thereof.

According to independent claim 1, the liquid cooling system includes a pump, a heat-receiving jacket, a radiator, flow passages and an ion exchange bag. The pump is used for supplying a cooling liquid, while the heat-receiving jacket receives heat from the electronic parts. The radiator is used to remove heat from the cooling

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liquid. Flow passages are used to circulate the cooling liquid in a route that passes through the radiator and back to the pump. Additionally, an ion exchange bag is disposed in part of the route. The ion exchange bag has a water-permeable bag and contains an ion exchange resin therein.

The Office Action alleges that Saitoh discloses all of the elements of independent claim 1. This is not the case, however. Saitoh discloses a laser apparatus and a cooling system therefor. The cooling system of Saitoh is configured as a large unit that is totally incapable for use as a cooling system for small electronic devices, such as, for example, a laptop computer. As discussed in the Specification, such devices require specialized cooling systems due to the size of motors capable of being utilized to circulate the cooling liquid. Thus, the cooling system is incapable of accommodating an ion exchanger as disclosed in Saitoh because such an arrangement requires a pump having a much larger capacity. Furthermore, as recited in independent claim 1, the ion exchange bag has a water-permeable structure that allows ion exchange on a surface of the ion exchange bag through diffusion and/or dispersion. Such a structure is simply not shown or suggested by Saitoh.

It is therefore respectfully submitted that independent claim 1 is allowable over the art of record.

Claims 2-4 dependent from independent claim 1, and are therefore believed allowable for at least the reasons set forth above with respect to independent claim 1. In addition, these claims each introduce novel elements that independently render them patentable over the art of record.

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**VII. Rejections under 35 U.S.C. §103**

Claims 1-5 were rejected under 35 U.S.C. §103(a) as being unpatentable over Messina in view of Saitoh. Regarding this rejection, the Office Action asserts that Messina discloses an electronic apparatus that includes most of the elements recited in independent claims 1 and 5. The Office Action admits that Messina does not disclose an ion exchange bag held within a container located upstream of the heat-receiving jacket and downstream of the radiator. The Office Action further notes that the use of an ion exchanger and filter is well known to be incorporated into the cooling system. Saitoh is relied upon for disclosing a cooling system having an ion exchange bag.

As discussed above with respect to independent claim 1, Saitoh fails to disclose specific features recited therein. As admitted in the Office Action, Messina does not disclose the use of an ion exchange bag. Therefore, inclusion of Messina as a secondary reference does not remedy the deficiencies of Saitoh. Further, as discussed in greater detail below, Messina and Saitoh do not appear to be properly combinable

It is therefore respectfully submitted that independent claim 1 is allowable over the art of record.

As amended, independent claim 5 defines an electronic apparatus that comprises:

- a heat-generation element mounted on a substrate;
- a heat-receiving jacket, being thermally connected to said heat-generation element;
- a heat radiation jacket for radiating heat of a heated liquid supplied from said heat-receiving jacket;
- a pump for circulating the liquid to those jackets;
- and

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a piping for connecting said pump and said both jackets, wherein:  
an ion exchange bag, having a water-permeable bag enclosing ion exchange resin therein, is provided on way of said piping, and  
said ion exchange bag enables ion exchange through diffusion on a surface thereof.

Similar to independent claim 1, independent claim 5 recites the limitation "said ion exchange bag enables ion exchange through diffusion on the surface thereof." As previously discussed with respect to independent claim 1, this particular feature is not shown or suggested by the art of record.

It is therefore respectfully submitted that independent claim 5 is allowable over the art of record.

Notwithstanding the failure of the references to disclose all the features of the claimed invention, as required for a *prima facie* case of obviousness, Applicants respectfully submit that the references are not properly combinable. Saitoh discloses a system designed for cooling a laser apparatus. Such systems typically require large quantities of cooling fluid and high volume pumps. Messina discloses a cooling system for electric components. The system of Messina is designed for cooling large scale electronic components that require power dissipation in the range of 75 to 120+ watts. See column 4, lines 51 to 55 of Messina. Thus, a skilled artisan seeking to provide a cooling system for a small device such as, for example, a laptop computer would not seek the teachings of either Messina or Saitoh to provide such a system. Further, even if such an artisan were to begin with the teachings of either reference, there is simply no motivation to seek out and combine the teachings of the remaining reference to arrive at the claimed invention. This is so because both references appear to be in different fields of endeavor from each other.

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Furthermore, the fields of endeavor of the references differ from that of the claimed invention. In fact, neither Messina nor Saitoh recognizes the problem addressed by the present invention. Consequently, neither reference is capable of providing any suggestion for arriving at a solution such as that provided in the instant invention and recited in the present claims.

Applicants therefore respectfully submit that the combination of Messina and Saitoh is improper.

#### **VIII. Conclusion**

For the reasons stated above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a Notice of Allowance is believed in order, and courteously solicited.

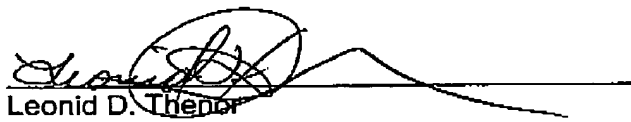
If the Examiner believes that there are any matters which can be resolved by way of either a personal or telephone interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

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**AUTHORIZATION**

Applicants request any shortage or excess in fees in connection with the filing of this paper, including extension of time fees, and for which no other form of payment is offered, be charged or credited to Deposit Account No. 01-2135 (Case: 520.43596X00).

Respectfully submitted,  
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